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VANCOUVER ISLAND BRYOLOGY, No. 1

DR. JOHN W. BAILEY.

Vancouver Island, which lies off the west coast of British Columbia, is mountainous, well wooded with evergreens on the highlands, and with alder and maple in the bottom lands. During seven months of the year it is shrouded with fog and bathed with gentle rains on the coast, while heavy snows fall in the interior. At this time every hillside depression becomes a rivulet and every ravine a rushing mountain torrent. On account of the amount of moisture in the atmosphere and the equibility of the climate, it presents an ideal habitat for many species of mosses, nearly all of which fruit abundantly. There is but little limestone on the island. Conglomerates, sandstone and shales are found associated with the coal deposits in the neighborhood of Nanaimo and Cumberland on the East Coast. My collecting was done at the latter place, forty miles south of the fiftieth parallel of latitude.

Cumberland is near Comox, a locality which Macoun visited some years ago for bryological purposes. Thirty miles to the south the extinct crater of Mt. Arrowsmith rises to an altitude of 5,600 feet, from whose sides and summit Macoun brought many interesting mosses. In this region the tree mosses are the first to attract one's attention. The maple trees (*Acer macrophyllum*) are covered with great mats or pillows of them. *Neckera Menziesii* prefers the trunks of these trees while *N. Douglasii* is found on the upper branches, though they grow intermingled. Nothing bryological is handsomer than the delicate orange colored capsules of *N. Douglasii* lying among the pale green leaves of the plant. *N. Douglasii* prefers moist shady localities for developing its sporophyte. *N. Menziesii* fruits at low altitudes wherever found. Its pinnae are a coppery red color, the capsule inserted and dark red in color.

Antitrichia curtipendula gigantea occurs in great cushions, more often on the horizontal limbs of trees. It grows on the evergreens as well as on the deciduous trees. The stoloniferous portion of the plant bears the capsule and it, like *Neckera Douglasii*, prefers dark cool situations in which to develop it. In late winter or early spring the growing tips of this moss are a golden yellow and the sombre forest takes on a new aspect, when these fresh yellow points begin to cover the brown cushions of previous years. I found very little *Antitrichia Californica*, and judged that Cumberland was out of its range.

Eurhynchium stoloniferum is found near the coast, at higher altitudes it disappears. Probably none of our coast mosses is more variable. It grows on wood or rocks. There are four distinct forms of it growing about Cumberland; the stoloniferous (var. *substoloniferum*) in long hairy masses on limbs of trees; a very large form growing in dark damp woods; a smaller tawny colored form growing on rocks in canons but not stoloniferous. This hung in long festoons over the rocks; a julaceous form, which when dry simulated *Scleropodium obtusifolium*, found on rocks in brooks wet by the spray of the rushing water, growing just above high water mark. Although

the various forms are so different in appearance, under the microscope the leaves are identical. The coarse doubly dentate margins, the strong midrib, and the punctate cells in the lower leaf angles are the same in all.

Claopodium crispifolium is common on rocks and trees. It is indistinguishable from *C. Bolanderi* except under the microscope. *C. Bolanderi* is found on rocks, while *C. Whippleanum* is found on rocks and soil and resembles *Plagiothecium elegans*.

Dendroalsia abietina is rare. Besides *E. stoloniferum* three Eurhynchiums are common, *Oreganum*, *praelongum* with its variety *Stokesii*, and *fallax*. *E. fallax* was to be found only at high altitudes. Growing at lower altitudes and hidden away about the roots of cedars is to be found a large Eurhynchium with variegated copper colored pinnae. One never obtained very much of it as it was hard to find. It belonged to the blunt leaved division of Eurhynchia. Its capsule was a beautiful chestnut red.

Plagiothecium undulatum is plentiful in proper locations. On humus or rotten logs, and *P. denticulatum* is common.

The Heterocladiums, *H. heteropteroides* and *H. procurrens*, are high-land mosses and are found on rocks. On vertical rocks, where there is plenty of water, *H. heteropteroides* assumes the variety *filescens*. On flat rocks it grows with short pinnae and fruits freely. *H. procurrens* is easily recognized by its complanate leaves and feathery pinnae and at altitudes of one thousand feet it becomes the commonest of the rock mosses.

Amblystegiums are rare in my locality though several are accredited to the island.

Seattle, Wash.

NOTES ON THE MOSSES OF WATERVILLE, NEW HAMPSHIRE.

ANNIE LORENZ.

The settlement of Waterville, N. H., lies in the Mad River Valley, at 1550 ft. altitude, north of Sandwich Dome, with Mt. Osceola (4352 ft.) forming the northern end of the valley. Very little collecting appears to have been done there. The only specimens seen by the writer are a few in the hotel herbarium, collected by Mrs. Helen E. Jelliffe in August, 1896.

Waterville is a granite-and-drift region, the absence of limestone making peculiar gaps in the flora, phanerogamous as well as cryptogamous. The most unusual place in the region is the ravine known as the "V" on the southern slope of Mt. Tripyramid. It consists of two steep granite slopes, meeting at an angle of 90 degrees, and running west by north. The southern side has a rich cover of *Sphagna*, various *Hypna* and *Hylacomia*, *Philonotis*, *Scapania*, and such, all heavily fruited. The best thing there is *Blindia acuta* (Huds.) B. & S. in good fruit.

The summit of Mt. Osceola is a crumbly trachytic granite, cushioned with *Polytrichum strictum* Banks, with *Dicranum fuscescens* Turn. and *D. longifolium* Ehrh. on the scrub balsam, although *Lophozia gracilis* (Schleich.) Steph. is really the principal product. *Sphagna* are abundant, but only casually examined by the writer. *Andreaea petrophila* Ehrh. is com-